What is claimed is:

1. A communications receiver, comprising:

a low noise amplifier (LNA) for amplifying a received signal so as to generate an LNA output signal, said LNA having M gain setting modes of operation, the gain of said LNA determined in response to an LNA gain control command;

a mixer for multiplying said LNA output signal with a local oscillator signal so as to generate a mixer output signal, said mixer having N gain setting modes of operation, the gain of said mixer determined in response to a mixer gain control signal command;

a detector for recovering, from said mixer output signal, information originally transmitted; and

a controller operative to generate said gain control command to said LNA and said mixer gain control command to said mixer, said controller adapted to set the gain setting of said LNA and of said mixer to one of a plurality of gain states, wherein each gain state consists of a unique combination of LNA gain setting and mixer gain setting.

2. The receiver according to claim 1, wherein said LNA gain control command comprises a plurality of $\log_2 M$ control lines, wherein M is a positive integer.

3. The receiver according to claim 2, wherein M equals two.

4. The receiver according to claim 1, wherein said mixer gain control command comprises a plurality of $\log_2 N$ control lines, wherein N is a positive integer.

5. The receiver according to claim 4, wherein N equals two.

6. The receiver according to claim 1, further comprising a band pass filter located before said LNA and adapted to filter the signal received from an antenna.

7. The receiver according to claim 1, further comprising a band pass filter located before said mixer and adapted to filter the LNA output signal before input to said mixer.

8. The receiver according to claim 1, further comprising a band pass filter located after said mixer and adapted to filter said mixer output.

9. The receiver according to claim 1, wherein said detector comprises:

a limiter adapted to limit the amplitude swing of a signal input thereto;

a discriminator adapted to generate an output voltage proportional to frequency deviations in the output of said limiter; and

a data slicer operative to apply a threshold to the output voltage of said discriminator so as to recover digital data therefrom.

10. A communications receiver, comprising:

a low noise amplifier (LNA) for amplifying a received signal so as to generate an LNA output signal, said LNA having a low gain and a high gain mode of operation, the gain of said LNA determined in response to an LNA gain control command;

a mixer for multiplying said LNA output signal with a local oscillator signal so as to generate a mixer output signal, said mixer having a low gain and a high gain mode of operation, the gain of said mixer determined in response to a mixer gain control command;

a detector for recovering, from said mixer output signal, information originally transmitted; and

a controller operative to generate said LNA gain control command and said mixer gain control command, said controller adapted to set the gain setting of said LNA and of said mixer to one of four gain states, wherein each gain state consists of a unique combination of LNA gain setting and mixer gain setting.

11. The receiver according to claim 10, further comprising a band pass filter located before said LNA and adapted to filter the signal received from an antenna.

12. The receiver according to claim 10, further comprising a band pass filter located before said mixer and adapted to filter the LNA output signal before input to said mixer.

13. The receiver according to claim 10, further comprising a band pass filter located after said mixer and adapted to filter said mixer output.

14. The receiver according to claim 10, wherein said detector comprises:

a limiter adapted to limit the amplitude swing of a signal input thereto;

a discriminator adapted to generate an output voltage proportional to frequency deviations in the output of said limiter; and

a data slicer operative to apply a threshold to the output voltage of said discriminator so as to recover digital data therefrom.

15. The receiver according to claim 10, wherein said controller is operative to set the LNA to low gain mode and said mixer to low gain mode to achieve maximum linearity and maximum 3rd order intercept point.

16. The receiver according to claim 10, wherein said controller is operative to set the LNA to low gain mode and said mixer to high gain mode to improve linearity while reducing sensitivity.

17. The receiver according to claim 10, wherein said controller is operative to set the LNA to high gain mode and said mixer to low gain mode to achieve greater linearity and higher 3rd order intercept point without substantially reducing sensitivity.

18. The receiver according to claim 10, wherein said controller is operative to set the LNA to high gain mode and said mixer to high gain mode to achieve maximum sensitivity.

19. A method of controlling the gain of a Low Noise Amplifier (LNA) and a mixer in a communication receiver, said method comprising the steps of:

providing an LNA circuit adapted to have at least two gain settings, namely a low gain mode of operation and a high gain mode of operation;

providing a mixer circuit adapted to have at least two gain settings, namely a low gain mode of operation and a high gain mode of operation;

setting the LNA to low gain mode and said mixer to low gain mode to achieve maximum linearity, maximum 3rd order intercept point and minimum sensitivity;

setting the LNA to low gain mode and said mixer to high gain mode to improve linearity while reducing sensitivity;

setting the LNA to high gain mode and said mixer to low gain mode to achieve greater linearity and higher 3rd order intercept point without substantially reducing sensitivity; and

setting said LNA to high gain mode and said mixer to high gain mode to achieve maximum sensitivity.

20. A communications receiver, comprising:

a low noise amplifier (LNA) for amplifying a received signal so as to generate an LNA output signal, said LNA having a low gain and a high gain mode of operation, the gain of said LNA determined in response to an LNA gain control signal;

a mixer for multiplying said LNA output signal with a local oscillator signal so as to generate a mixer output signal, said mixer having a low gain and a high gain mode of operation, the gain of said mixer determined in response to a mixer gain control signal;

a detector for recovering, from said mixer output signal, information originally transmitted;

a controller adapted to switch said receiver into any of four states via said LNA gain control signal and said mixer gain control signal, said states corresponding to the combination of low and high gain modes of said LNA and said mixer; and

wherein said controller is operative to:

initialize said receiver to a high sensitivity state wherein said LNA and said mixer are set to a high gain mode of operation; and

switching to a state having lower sensitivity in response to low correlation of the signal output of said detector with an expected signal.

21. A communications receiver coupled to a communications channel, comprising:

a low noise amplifier (LNA) for amplifying a received signal so as to generate an LNA output signal, said LNA having a low gain and a high gain mode of operation, the gain of said LNA determined in response to an LNA gain control signal;

a mixer for multiplying said LNA output signal with a local oscillator signal so as to generate a mixer output signal, said mixer having a low gain and a high gain mode of operation, the gain of said mixer determined in response to a mixer gain control signal;

a detector for recovering, from said mixer output signal, information originally transmitted;

monitoring means for monitoring the error rate at the output of said receiver so as to estimate the quality of said channel;

a controller adapted to switch said receiver into any of four states via said LNA gain control signal and said mixer gain control signal, said states corresponding to the combination of low and high gain modes of said LNA and said mixer; and

wherein said controller is operative to:

set the state of said receiver from a previous state to a new state in accordance with the current error rate measured by said monitoring means;

switch said receiver back to said previous state if the error rate obtained in said new state is worse than that obtained in said previous state.

~~22~~ A communications receiver coupled to a communications channel, comprising:

a low noise amplifier (LNA) for amplifying a received signal so as to generate an LNA output signal, said LNA having a low gain and a high gain mode of operation, the gain of said LNA determined in response to an LNA gain control signal;

a mixer for multiplying said LNA output signal with a local oscillator signal so as to generate a mixer output signal, said mixer having a low gain and a high gain mode of operation, the gain of said mixer determined in response to a mixer gain control signal;

a detector for recovering, from said mixer output signal, information originally transmitted;

first monitoring means for monitoring the error rate of said receiver so as to estimate the quality of said channel;

second monitoring means for measuring a received signal strength indicator (RSSI) signal of said receiver;

a controller adapted to switch said receiver into any of four states via said LNA gain control signal and said mixer gain control signal, said states corresponding to the combination of low and high gain modes of said LNA and said mixer; and

wherein said controller is operative to:

set the state of said receiver to a low gain state in response to a high RSSI reading and a high error rate;

leave the state of said receiver in a high gain state in response to low RSSI reading and a high error rate.